

# TOBY-L2 series



## Multi-mode LTE Cat 4 modules with HSPA+ and/or 2G fallback



Standard



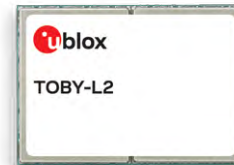
Professional



Automotive

### Simple integration with the ELLA-W131 Wi-Fi module

- Compact TOBY LGA form factor for easy manufacturing
- Easy migration between u-blox 2G, 3G and 4G modules
- Automotive grade available, qualified according to ISO 16750
- Deliver critical firmware updates over the air
- TOBY-L201 switches automatically between AT&T and Verizon



24.8 × 35.6 × 2.6 mm

### Product description

TOBY-L2 series modules support multi-band LTE-FDD, along with DC-HSPA+ and EGPRS in a very small LGA package.

With 3GPP Rel. 9 and LTE Cat 4, which provides data throughput up to 150 Mbit/s, the modules are ideal for both industrial and consumer applications requiring the highest data-rates.

They are the perfect choice for vehicle infotainment systems, ruggedized mobile terminals, set top boxes, notebooks, tablets, as well as high-speed M2M applications such as digital signage, mobile health, remote security and video systems where backwards compatibility with 3G and 2G networks is desired.

The modules support Circuit-Switched-Fall-Back voice. They guarantee HSPA+ connectivity, also in areas that do not yet have LTE coverage.

The temperature range from -40 °C to +85 °C guarantees

operation in harsh environments and in very compact designs. The TOBY-L201 works on AT&T and Verizon networks and can switch between the operators, based on the SIM card used or via an AT command.

The compact LGA package enables straightforward automated manufacturing. Easy migration from u-blox UMTS, CDMA, and GSM modules maximizes the investments of customers, simplify logistics, and implies a very short time-to-market.

TOBY-L2 modules are manufactured in ISO/TS 16949 certified sites, with the highest production standards and the highest quality and reliability. Each module is fully tested and inspected during production. Modules are qualified according to ISO 16750 – for systems installed in vehicles.

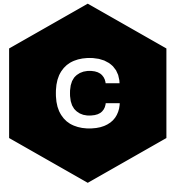
USB drivers and RIL software for Android are free of charge.

### Product selector

| Model     | Region          | Access Technology     |                  |                   |                        |           |      | Interfaces |         |                        |               |      | Audio        | Features      | Grade              |                  |                         |      |                      |          |              |            |
|-----------|-----------------|-----------------------|------------------|-------------------|------------------------|-----------|------|------------|---------|------------------------|---------------|------|--------------|---------------|--------------------|------------------|-------------------------|------|----------------------|----------|--------------|------------|
|           |                 | 3GPP Release Baseline | LTE FDD category | LTE bands         | UMTS bands             | GSM bands | MIMO | UART       | USB 2.0 | DDC (I <sup>2</sup> C) | SDIO (Master) | GPIO | Analog audio | Digital audio | Antenna supervisor | Embedded TCP/UDP | Embedded HTTP, FTP, SSL | FOTA | Dual stack IPv4/IPv6 | Standard | Professional | Automotive |
| TOBY-L200 | North America   | 9                     | 4                | 2, 4, 5, 7, 17    | 850/900/1700/1900/2100 | Q         | 2x2  | 1          | 1       | 1                      | 1             | 14   | 1            |               | •                  | •                | •                       | •    | •                    | •        | •            | •          |
| TOBY-L201 | North America   | 9                     | 4                | 2, 4, 5, 13, 17   | 850/1900               |           | 2x2  | 1          | 1       |                        | 1             | 14   |              |               | •                  | •                | •                       | •    | •                    |          |              | •          |
| TOBY-L210 | Europe / APAC   | 9                     | 4                | 1, 3, 5, 7, 8, 20 | 850/900/1900/2100      | Q         | 2x2  | 1          | 1       | 1                      | 1             | 14   | 1            |               | •                  | •                | •                       | •    | •                    |          |              | •          |
| TOBY-L220 | Japan           | 9                     | 4                | 1, 3, 5, 8, 19    | 850/900/2100           |           | 2x2  | 1          | 1       | 1                      | 1             | 14   | 1            |               | •                  | •                | •                       | •    | •                    |          |              | •          |
| TOBY-L280 | S.America/ APAC | 9                     | 4                | 1, 3, 5, 7, 8, 28 | 850/900/1900/2100      | Q         | 2x2  | 1          | 1       | 1                      | 1             | 14   | 1            |               | •                  | •                | •                       | •    | •                    |          |              | •          |

Q = Quad-band

# TOBY-L2 series



## Features

|               |                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LTE           | Cat 4 (150 Mbit/s DL, 50 Mbit/s UL)<br>3GPP Release 9<br>FDD Bands:<br>– TOBY-L200: 2, 4, 5, 7, 17 (N. America)<br>– TOBY-L201: 2, 4, 5, 13, 17 (N. America)<br>– TOBY-L210: 1, 3, 5, 7, 8, 20 (EU/Asia/Africa)<br>– TOBY-L220: 1, 3, 5, 8, 19 (Japan)<br>– TOBY-L280: 1, 3, 5, 7, 8, 28 (APAC)<br>All channel bandwidths: 1.4 - 20 MHz<br>MIMO 2x2<br>Rx diversity |
| UMTS/DC-HSPA+ | Bands (in MHz):<br>– TOBY-L200: 850/900/1700/1900/2100<br>– TOBY-L201: 850/1900<br>– TOBY-L210: 850/900/1900/2100<br>– TOBY-L220: 850/900/2100<br>– TOBY-L280: 850/900/1900/2100<br>42 Mbit/s downlink, 5.76 Mbit/s uplink                                                                                                                                          |
| GSM           | Bands (in MHz):<br>– TOBY-L200: 850/900/1800/1900<br>– TOBY-L210: 850/900/1800/1900<br>– TOBY-L280: 850/900/1800/1900<br>GPRS & EDGE Class 12                                                                                                                                                                                                                       |
| SMS           | MT/MO PDU / Text mode<br>SMS over IMS and via SMS-C                                                                                                                                                                                                                                                                                                                 |
| Voice         | CSFB<br>Codec: HR/FR/EFR/AMR/AMR-WB<br>Echo cancelation & noise reduction                                                                                                                                                                                                                                                                                           |

## Software features

|                  |                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Protocols        | Dual stack IPv4 / IPv6<br>Embedded TCP/IP, UDP/IP<br>HTTP/FTP/SSL (Secure Socket Layer)<br>eSIM and Bearer Independent Protocol |
| Wi-Fi interface  | To ELLA-W1 module                                                                                                               |
| Firmware upgrade | Via UART and USB<br>Via FOTA                                                                                                    |

## Interfaces<sup>1</sup>

|        |                                                                                             |
|--------|---------------------------------------------------------------------------------------------|
| Serial | 1 UART<br>1 USB 2.0 (high-speed, 480 Mbit/s)<br>1 DDC (I <sup>2</sup> C)<br>1 SDIO (Master) |
| GPIO   | Up to 14 GPIOs, configurable                                                                |
| (U)SIM | Supports 1.8 V and 3.0 V, SIM toolkit                                                       |
| Audio  | 1 digital                                                                                   |

<sup>1</sup> Available in future firmware release

## Further information

For contact information, see [www.u-blox.com/contact-us](http://www.u-blox.com/contact-us).

For more product details and ordering information, see the [product data sheet](#).

## Package

152-pin LGA (Land Grid Array): 24.8 x 35.6 x 2.6 mm, 4.8 g

## Electrical data

|                     |                                                           |
|---------------------|-----------------------------------------------------------|
| Power supply        | 3.8 V nominal, range 3.4 V to 4.35 V                      |
| Consumption current | Connected mode LTE max power: 610 mA<br>Idle mode: 1.1 mA |

## Environmental data, quality & reliability

Operating temperature –40 °C to +85 °C (extended range)

RoHS compliant (lead-free)

Qualification according to ISO 16750

Manufactured in ISO/TS 16949 certified production sites

## Certifications and approvals

|           |                                                                                                                                                  |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| TOBY-L200 | PTCRB, GCF, FCC, ISED (formerly known as IC), RED (formerly known as R&TTE), AT&T, Anatel, Rogers (Canada)                                       |
| TOBY-L201 | PTCRB, GCF, FCC, ISED (formerly known as IC), AT&T, Verizon                                                                                      |
| TOBY-L210 | PTCRB, GCF, FCC, ISED (formerly known as IC), RED (formerly known as R&TTE), RCM (Australia), NCC, KCC (Korea), Giteki (Japan), Softbank (Japan) |
| TOBY-L220 | Giteki (Japan), NTT DoCoMo (Japan)                                                                                                               |
| TOBY-L280 | PTCRB, GCF, FCC, ISED (formerly known as IC), RED (formerly known as R&TTE), RCM (Australia), NCC, Anatel (Brazil)                               |

## Support products

|              |                                                                       |
|--------------|-----------------------------------------------------------------------|
| EVK-L2x      | Evaluation Kits for TOBY-L2 series                                    |
| RIL software | Available for Android                                                 |
| USB driver   | Available for Embedded Windows 6.0, 7, 2013 and Windows 7, 8, 8.1, 10 |

## Product variants

|           |                                                                                                                  |
|-----------|------------------------------------------------------------------------------------------------------------------|
| TOBY-L200 | LTE Cat 4 / DC-HSPA+ / EGPRS modules for North America; LTE bands 2, 4, 5, 7, 17                                 |
| TOBY-L201 | LTE Cat 4 / DC-HSPA+ modules for North America; LTE Bands 2, 4, 5, 13, 17<br>Ability to switch between operators |
| TOBY-L210 | LTE Cat 4 / DC-HSPA+ / EGPRS modules for Europe and APAC; LTE bands 1, 3, 5, 7, 8, 20                            |
| TOBY-L220 | LTE Cat 4 / DC-HSPA+ modules for Japan; LTE bands 1, 3, 5, 8, 19                                                 |
| TOBY-L280 | LTE Cat 4 / DC-HSPA+ / EGPRS modules for APAC and South America; LTE bands 1, 3, 5, 7, 8, 28                     |

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